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EDITORIAL

The Problems of the Unemployed Chemist

FACTS are the building stones of human judgment. They must be collected, sorted, and assembled properly before they can be useful in guiding our actions. The first essential is to obtain the facts. Next, we must weigh them on the balance of experience, measure them in terms of accepted standards, and finally fit them into the pattern of thought consistent with the highest concept of the problem under consideration. It is not easy to know the problem. The natural tendency of the average of us is to see the problem in the setting of our own limited interests and experience.

If one is in a position to know only of a need for expert chemists of special training, organic research, physical chemical research, limited to specific problems, his facts concerning the degree of unemployment among chemists are bound to be too limited to justify a weighed judgment. He may know of a demand for the type of specialist he is particularly interested in and qualified to advise about, when there is actually a surplus of adequately trained men for other types of service in chemistry. We must consider the chemical profession as a whole in dealing with the problem of unemployment among chemists.

The unemployment problem is intricate and its solution requires careful analysis and planning. For the immediate present the imperative demand is to help those in need. This help must not be confined to supplying financial aid. It must extend to a proper study of the individual cases to help in readjustment when indicated.

There are those who have served to the utmost of their ability in the application of available chemical knowledge to the needs of industry, but who are now handicapped in competition with others by their lack of fundamental training. They have served the chemical profession in time of need and they assume they are chemists. They were very useful when better trained men were not available. Now, in comparison with men adequately trained, they are not good enough to think through the complex problems of chemistry and they are made obsolete by the new conditions. A place must be found for them in society and we must

aid them in the readjustment which is essential to the progress of both the chemical profession and the chemical industry.

The chemical profession embraces a wide variety of interests with their problems and their demands for service of highly specialized types. With specialization there comes an increase in the degree of obsolescence of the service investment. The problems of unemployment are complicated by the existence of unemployables. This is a situation which we cannot ignore. We must plan to meet it. In our planning we must keep ever before us the purpose of the profession and the status which it should enjoy. In our attempts to raise the status of the profession we must do no injustice to those who, when measured in terms of our standards, are found wanting. At the same time we must assume the obligation to give to the chemical profession the best in thought and action. It is our problem to harmonize these divergent conditions.

We should take steps to ascertain immediately the true situation regarding unemployment among chemists in this country. This study should embrace: (1) a careful survey of the fitness of each unemployed person claiming recognition as a chemist, (2) a study of the positions that are now available and those that could be possible if the services of chemists were more widely applied to the solution of social and economic problems, (3) provision of adequate training for those capable of serving in chemistry, (4) regulation of the numbers admitted to the profession within the possibilities of absorption and (5) erection of facilities for handling the problems of employment and unemployment of chemists. To this end, we must provide and maintain a bureau of appointments which will be charged with the responsibility of seeing that the right man is found for the solution of every chemical problem and that proper and adequate adjustments in employment are made to meet the conditions of the advances in our civilization.

To act promptly and efficiently we must have the solidarity which comes from group effort. This is the main purpose of a profession. Every member is privileged to work for the good of the group and obligated at the same time to society to provide for the best possible in professional service.

M. L. CROSSLEY

Chemistry at the State University of Iowa

By Edward Bartow

Development of Chemical Instruction at a major Middle Western State Institution.

THE State University of Iowa was chartered and located in Iowa City in 1847, but it was not until 1855 that the work of instruction began. As the state capital was to be moved to Des Moines, the state buildings and the lot on which they stood were given to the University. The original capitol building has always been used by the University and at the present time contains the executive offices. The governor of the state wished to open the university to those who did not have preparation in the classics; several colleges requiring work in the classics for entrance having already been established in the state. We find, therefore, in connection with the establishment of the University the following:

"While the University was framed to furnish the loftiest style of culture, it can also adapt itself to the lowest. By its rejection of college classes, and its adoption of individual departments, it is enabled to furnish to the student just what instruction he requires without at the same time compelling him to receive much that he does not want. Ordinary colleges by rendering classical attainments necessary to the entrance of the student, exclude many who design to fit themselves for the common pursuits of life, from the halls of learning. To this large class those departments of the University which require no previous classical attainment offer a ready admission and afford facilities for instruction. The trustees, therefore, deem themselves fortunate in having adopted an organization, which while it offers to college graduates a scientific course of instruction which they cannot there obtain, can at the same time furnish to those excluded from college halls, the means of perfecting themselves in farming, mechanical, commercial, and other ordinary pursuits of life."

The first and second circulars issued in September, 1855, and July, 1856, showed that chemistry was given a place on the curriculum by the appointment of Josiah D. Whitney, A.M., as professor of chemistry.

The subjects included as chemistry and physics at a later date were taught, but with special emphasis on agriculture and the arts. The small scale on which the department started is indicated by the following quotations from the first catalog of July, 1856:

"A liberal appropriation has been made for supplying this department with apparatus and chemicals; and any demands for instruction in this connection during the year will be promptly met." Under the heading, library and apparatus, it states "An appropriation of several hundred dollars will be applied during the year for putting the chemical department in working order."

A department of natural philosophy and chemistry appears in a "Plan of Organization" which was reported by President Silas Totten and adopted by the trustees, June 27, 1860. The versatility of the professors who held this chair is shown in the catalogs from 1859–1862. During this time, Rev. James Lillie, M.D., D.D., appears first in the above chair and then as professor of ancient and modern languages, having exchanged places with Rev. O. M. Spencer, A.M., later D.D. Rev. Spencer later became president of the University, professor of intellectual and moral philosophy and rhetoric, and acting professor of chemistry and natural philosophy.

GUSTAVUS HINRICHS, C.P., appears as professor of modern languages in 1862. In 1863, he was made professor of natural philosophy and teacher of modern languages. He dropped the teaching of modern languages the next year and for many years was at the head of the physical science in the institution. He improved the facilities for instruction and enlarged the chemical laboratory. Later the entire first story of North Hall, a new building, was given over to the chemical laboratory. It was provided with what was considered the necessary apparatus, chemicals, etc. Professor Hinrichs made detailed plans for a laboratory, but for want of funds, only about one-third of the plans were carried out. The catalog claims "when completed, this laboratory will be second to none in the United States." It was used until 1885.

In 1885–1886, a new laboratory was constructed under the direction of Launcelot W. Andrews, Ph.D., professor of physical science and chemistry, and director of the chemical laboratory. This laboratory occupied two floors of the building, 150 × 105 feet, and contained 25 rooms, designed to afford facilities for a wide range of chemical work. As the department continued to grow, modifications were made in the building and annexes were added so that in 1920, Close Hall, built for a

Y. M. C. A. was used for offices, recitation rooms, with chemical engineering laboratories in the gymnasium. One hundred and twenty-five first-year students were accommodated in a store building and three hundred in a wooden structure built and used by the R. O. T. C. for dining room and kitchen. Launcelot W. Andrews was succeeded by E. W. Rockwood in 1904 and Edward Bartow became head of the department in 1920.

The chemistry building with its three annexes was so inadequate that the present building was authorized in 1921, and occupied in 1923. The new building at the corner of Capitol and Market Streets is on a hillside overlooking the Iowa River. The plan of the building is known as open-court construction, and the finished structure, to occupy a city block 320 feet square, will resemble two E's placed back to back. The completed section of the building, or five-twelfths of the whole, cost $450,000.00, and its equipment, $225,000.00. The building is of reinforced concrete trimmed with Indiana limestone with curtain walls of brick. The interior walls are finished in concrete brick, made on the ground, with one part of cement to four parts of sand. Floors are of concrete with the exception of the main corridor, which is of terrazzo.

THE building is planned so that the main lecture rooms and library are easily accessible from the street. To enter the principal lecture room, one passes through the lobby, crosses a corridor, and enters the rear of the room; or from the south entrance a short corridor on the floor below leads to the level of the lecture table. This room contains 441 seats and 75 or more additional chairs can be added. A second lecture room with 174 seats can be entered from two floors. The acoustic properties of these rooms are excellent, due possibly to the porous brick walls, which giving an uneven surface, prevent reflection of sound, and to the fiber board ceiling, rough and porous in nature which might also prevent reflection.

Directly above the principal lecture room is the library. It is readily reached from the main entrance by a flight of stairs. The library has windows on three sides of the reading room; on the fourth side are stacks to accommodate 30,000 books. At present there are nearly 10,000 books in the Chemistry Library. About four hundred journals abstracted by *Chemical Abstracts* are available on the University campus, including 84 chemical journals, which are on the shelves in the chemistry library.

Laboratories in the wings extend to the right and left of the central

structure. Each wing on each floor is reached by corridors so placed that it is unnecessary to pass through any general laboratory in going from one part of the building to another. A general laboratory unit on each floor of each wing is 57 feet wide and 81 feet long. Space in these units assigned to general laboratories varies from 18 feet to 72 feet according to the needs of the divisions.

Ventilation is simple and quite satisfactory. Fumes from fume-boxes or hoods are carried from the rooms by exhaust fans suspended from the ceiling at the extreme end of each floor of each wing. Offices for professors and instructors have been placed along the corridors connecting the two wings. There are twelve suites for professors, each consisting of an office and private laboratory. There are twelve rooms for instructors with laboratory tables and space for desk.

The industrial chemistry or chemical engineering laboratory occupies two floors on the lower wing with an opening between the two to accommodate the taller apparatus. Ample storerooms located in the geographical center of the proposed complete building are connected by elevator and dumb waiter. All the available space in the corridors is occupied either by display cases or lockers. Fifty-four display cases have been installed. The Department of Chemistry is supplied with the standard equipment needed by the various divisions. A glassblower and a mechanician in well-equipped shops construct apparatus to meet particular requirements.

THE organization of the department includes nine divisions: (1) Analytical chemistry; (2) Biochemistry; (3) Industrial chemistry and chemical engineering; (4) Inorganic chemistry; (5) Metallurgy; (6) Organic chemistry; (7) Physical chemistry; (8) Toxicology; (9) Water and sewage chemistry. Introductory courses are offered by these divisions, and special investigations are being carried on. Some of the problems being studied are given below. The problems vary in their nature from studies in pure chemistry to investigations of the application of chemistry to practical problems of the day.

Because of its location, our division of chemical engineering is devoting considerable time to a study of Iowa coals with reference to their improvement so that they may compete with better raw coals from neighboring states. Studies are being made of the utilization of wastes from beet sugar and corn products industries. In biochemistry, vitamins, antioxidants, and fats are under investigation. In organic chemistry, stress has been laid on studies of molecular rearrangement, and

studies of certain special types of amines. In physical chemistry, free energy change, vapor pressures, and adsorption are being studied. The chemical laboratories in the college of pharmacy and in the department of pediatrics and hygiene are carrying on chemical studies in their special fields.

The majority of those who have obtained their doctor's degrees have gone into teaching, and are located in institutions especially in the south and southwest. However, many have gone into industry and are succeeding in their chosen fields. Undergraduate majors in chemistry must conform to the rules of the College of Liberal Arts and Science. These rules demand 24 semester hours of credit in chemistry after the freshman year, but not more than 40 semester hours credit in all. The department asks that the hours include inorganic chemistry, 8 hours; analytical chemistry, 8 hours; organic chemistry, 10 hours; and possibly physical chemistry, 10 hours. If these courses are taken, four additional hours may be included in a major. Special courses in chemistry and chemical engineering have courses of study outlined in the catalog but for the most part these vary but little from the standard requirements of the liberal arts college.

Undergraduate instruction in chemistry includes more service to other colleges and departments than to the chemistry majors. College of Medicine requires inorganic, 8 hours; organic, 4 hours; and analytical, 4 hours, for entrance; and biochemistry, after entrance into the Medical School. The College of Dentistry requires 8 hours of inorganic, for entrance, 5 hours of organic, 4 hours of analytical, and 2 hours of dental metallurgy. The College of Pharmacy in its various courses requires inorganic, 8 hours; organic, 10 hours; quantitative analysis, 8 hours; physical chemistry, 8 hours; biochemistry, 3 hours. The College of Engineering requires 8 hours inorganic of all students.

THE enrollment in the graduate college as in the undergraduate colleges is unlimited. No department can select its students, but standards must be followed. The graduate college requires a grade above D for credit and the department itself requires qualifying examinations in the four fundamentals or an equivalent. Graduate work is offered in the nine divisions of the department. Chemical engineering and biochemistry are divisions of the chemistry department.

The master's degree is granted after not less than a year's work in residence following the bachelor's degree. A satisfactory thesis and an

(*Please turn to page 51*)

Can Science Be Humanized?*

By T. Swann Harding

"Science has the key to all problems in human relations." Can it turn from impersonal observation to help solve the problems of everyday life?

A YAWNING chasm separates science from humanism today. By "humanism" I have reference to no particular philosophic sect. I mean in mere dictionary terms any system, mode, or attitude of thought or action centering distinctly upon human interests and ideals. The scientist engaged in research in his laboratory is one aspect of the problem; but the ultimate product of that research as it reaches the average human being is something altogether different. While nutrition scientists are still puzzled about vitamins and their behavior, the market is full of advertising clamor urging us to take this or that vitamin concentrate and be healed of all ills. It seems almost impossible accurately to state the findings of science in terms of lay understanding.

Yet if this gap cannot be bridged science remains too inhuman. Does the existence of that chasm even bother scientists as much as it should? For the past decade or more my own work has involved me in laboratory investigations, in the reading of technical papers in which others have recorded their findings, and in preparing occasional scientific papers of my own for publication. In more recent years I have been compelled to read critically the papers prepared by scientists of all varieties upon topics that run the gamut from physics to botany, from chemistry to plant pathology, and from bacteriology to forestry and meteorology, and back again.

These manuscripts and published papers, like practically all such contributions, are expressed in a carefully uniform style from which all human values have been abstracted with utmost care. Except for very rare and occasional bits of individualistically cumbersome or obscure syntax, or pet grammatical lapses, one might easily suppose that every one of these papers had been written by the self-same person for the past forty years, though I should hesitate to give a description of that person.

* An address given before the Washington Chapter on Jan. 11, 1935.

This is not altogether true because in rare instances a human personality does somehow crawl through the network of studied rhetorical mediocrity. But it is an apparent ideal, and so called literary or humanistic expressions are *per se* tabu among both scientists and technical editors. For the Goddess of Science is named Impersonality, and she is an austere and forbidding, not a voluptuous, creature.

In order to worship that Goddess the scientist finds himself in perpetual conflict with himself. He sets out to clarify his judgment, to keep his emotions on ice, to make due allowance for his idiosyncrasies, and thus to reach unprejudiced conclusions. He is at war with his own organism and with the common customs and habits of mankind. To aid himself in his work he deliberately cultivates an arid and extreme impersonality which tends to lack life, vigor, and human touches. Rather than use the first personal pronoun he will undertake almost any verbal circumlocution no matter how horrid or offensive.

IN a larger sense the scientist has been trained to brush the humanities aside. Time was, of course, when the humanities brushed science aside. Science had to fight desperately to win a respectable place in university curricula. That time, however, is no more. Science now feels self-sufficient and tends, with public adulation, to brush the humanities aside. True, scientists but rarely go on record as to the actual truth that, in so far as they are actually scientists, they are out and out materialists. But they are never in actuality as dehumanized as their technical papers might lead one to think. Yet as Eddington said in the 1927 Gifford Lectures when you write "the body of the elephant slid down the grassy slope" your true scientist has no interest whatever. But when you add that the elephant weighed 20 tons, he is interested at once.

For he has been trained to abstract weights, or pointer readings, from the vastness of his physical environment, and to proceed from them to his broader deductions which he may or may not later be able to apply to humanity in general. This is pious and decorous work, this abstracting segments of reality and making pointer readings. It makes for quiet, order, and an absence of controversy. Therefore whenever some scientist, with a generalized rather than merely a highly specialized mental equipment, suddenly whips across the horizon with some wise or useful saying that is directly applicable in human terms, the decent solemnities have been violated and order seems revoked.

One can refer again to 1927 for an example. It was at the meeting of the American Association for the Advancement of Science that year

that Prof. Harry Elmer Barnes became very candid in speaking about God. His address was a frank deviation into almost pure humanism. Almost at once he was indirectly rebuked by the President of the Section he addressed. It was feared that he might offend the churches. But, aside from that, no true scientist had a right to bring a humanistic problem to the shocked attention of his fellows. That was not done. Yet has science become so utterly precieuse that even a sociologist must not dare consider a human problem of such magnitude and importance as the interpretation of those subjective, slightly morbid psychological phenomena called religious?

REVERTING now to the scientists who wrote the hundreds of papers I have read—they were each and every one imbued with the idea that their conclusions were characterized by finality and truth. Their expressions were remotely objective as if God himself had spoken, impersonal and severe. Yet one could not take their statements as revealed truth because the human element stuck out of every pore of every scientific paper that could be traced to its lair. Not only that, humanism every once in a while breaks right out in the paper itself, a form of modern sacrilege that merits excommunication.

Thus the investigator will now and then very frankly confess his own shortcomings and say that the reader must allow for these limitations and for what are often purely human deficiencies. In a moment of aberration he threw away all the samples for a period of two days and he trusts you will take his composite reports on samples taken each day for a period of two months as just as accurate as if he had also analyzed the samples for those two days. In the best of cases each paper published is no more than this: It is a presentation of the sincere and honest (one hopes) conclusions of this human organism, James Jones, when he has done his utmost to clear his mind of bias, to observe with care, to report with accuracy, and to conclude with sound logic from the facts as he understands the facts, the good Lord help him.

Thus a certain noted biologist draws certain conclusions about the rate of living or future human population increases from data relating to the activities of certain flies. Well and good. But that is after all his collection of data, and his individual conclusion from that data. It is more reliable work than mine would be because he is a trained investigator in this subject and I am not. He is also trying to be objective and unbiased. But he cannot finally eliminate himself altogether, his desires, his beliefs, and his hopes. I am not reprehending him. He simply does what every other research worker has to do.

I myself once got into a very remote and obscure field in nutrition. I isolated from blood a compound another investigator had isolated from yeast and from tissues but claimed did not occur in blood. Two or three other workers entered the field in different laboratories. They isolated the same substance that I had. The original investigator now tried his hand again and found, to his amazement, that he could not prepare either the substance we had prepared or the one he had originally made himself from yeast and tissue. Five laboratories in three different countries became involved in the chase of that organic substance only at last to find that we were all wrong!

The substance did not exist either as we had prepared it from blood or as the original investigator had from yeast and tissues. The true substance was more complicated than ours and it broke down during our method of preparation. Oddly enough we all worked so nearly alike that we all broke off one large fragment of the compound, perhaps three-quarters of it, analyzed that and announced it as the real thing. Indeed the original investigator actually claimed to have synthesized it from its simple constituents, yet he had not done so. In good time all concerned recognized the true substance and learned how to make it, but for many long months they argued about a material which they merely believed, with no little passion, to be what they were after.

SO back of every investigator's published data, curves, and verbiage stand all these things. But what the laity want to know is life evaluated in terms of achievement and happiness and how this new knowledge will affect life. Can you compare Thomas Parr with Schubert, or with Shelley? Who got the most out of life, and why? And what did science ever have to do with it anyway? It is one thing to know that one person out of so many will live to be 100 but shall I live to be 100 and, if so, shall I have full possession of my faculties and enjoy life? That is what I want to know.

At every point these humanistic problems pop out of scientific problems, demand consideration, yet are often politely ignored. I once worked on what are called the "rare sugars," sugars truly in chemical structure, but very rare. This was a remote and theoretical subject for research. What use were rare sugars? Then the influenza epidemic of 1918–1919 persuaded many bacteriologists to seek the causative organism. They used these sugars in trying to make their differentiations between bacteria. In time they failed and the sugars lost their humanistic properties, pregnant with the possibility of saving lives. But to me those sugars were always names, labels of bottles containing white

powders with certain solubilities, ash contents, specific rotations, and other properties—utterly dehumanized.

Later I worked on the nutrition of cattle. What did I do? Did I feed cows? Not at all. I analyzed small samples of their blood for elusive organic compounds there in infinitesimal quantities. I did this by a colorimetric method which involved many errors and was all as uncowlike as a rolling mill. I published impersonal papers and have yet to feed a cow. Indeed I seldom even saw one. The work was feed research of a kind and may ultimately have had some practical utility. To me it had specific, intrinsic, but nonhuman value. But note the opposition I had to overcome here to be dehumanized enough to perform this work. The example is typical.

Each scientific specialist is in his compartment. So complex and remote from life is his work that he could not even find words to explain it to the average educated person. No wonder humanists feel that it is esoteric and perhaps of small value. No wonder at all they resent it when a scientist dares what scientists seldom dare, to express himself humanistically.

So when Barnes discussed religion at a scientific meeting he violated a very sacred tabu. His manner was perhaps emotionally provocative, though his hearers should, impersonally, have allowed for that. The reaction was somewhat as one would expect if he appeared nude at a very proper reception. The general feeling was that science should be indifferent to—*i. e.*, not get involved with religion. But this is absurd. For even the human values that seep out of the driest and most inhuman papers by scientists are important and should come within the purview of science.

A SCIENTIST should know why he believes what he believes. Yet it is quite possible for a research worker to get into such a rarified atmosphere that he not only neglects human values altogether, but fails to act even intelligently. Thus I knew one who became so humanly seduced by the perfection of his abstracting, indexing, and filing system, that he began to collect abstracts of scientific articles as others do postage stamps; he became so enamoured of his new pursuit that he followed this fruitless occupation (for some of his "abstracts" were longer than the original articles) for over two years before it occurred to him to work in the laboratory again. I have known others to plan and to carry out, yes, and to publish, work that was shallow, unoriginal, and entirely superfluous because the possibilities of some new technique bewitched them.

These are secrets of the research laboratory, seldom told, but very revealing of the human beings there. These things are true of even the most materialistically inclined laboratories and today even psychology seeks to become materialistic. Behaviorism has vowed itself undeniably to dehumanized objectivity. This is not to be condemned so long as a science does not resolutely determine to progress only by aping the methods of other and perhaps too unrelated sciences which appear to be more "exact," though no science is ever really exact. Behaviorism is a necessary segment of psychology and a legitimate one. But it is not psychology and those who believe that it is forget human values.

On the other hand that most stable, exact, ponderable, invariant, deterministic, materialistic of sciences, physics, has reverted from these adjectives. It has gone in the opposite direction in recent years. It embraces philosophy and some of its practitioners make its metaphysics quite spiritualistic (not spiritistic). Eddington, Jeans, and others have gone so far toward humanizing physics that they have given their abstractions unwarranted values whereupon Einstein gently remarks that these thaumaturgic gentlemen do actually reason logically and scientifically . . . in their respective laboratories! Yet America has a leading physicist who is an evangelical Christian and seeks to state all scientific laws in terms satisfactory to quasi-fundamentalist theology.

IN short, physics is humanized, but has humanism been treated with sufficient science for its own good? One physicist looks into the atom and sees the image of an unrelenting God; another looks at the quantum unit and does not see God, but rather a mandate for free will. One astronomer sweeps the heavens and sees divine omnipotence while another observes the very same panorama and sees only aimless fortuity, vastness, and human inconsequence. One person looks out upon nature and the birds and animals and sees God's handiwork; another surveys the same scene and sees pure beauty, nothing more. Yet another observes it and sees simply nature; this he studies scientifically but secularly.

What can be done? It appears that studied scientific indifferentism has gone on long enough. Science may become so abstract and otherworldly as to have no human significance whatever and, after all, we answer the scientist as we do the philosopher who expatiates on the puny unimportance of man—on our human scale of values humanity, its acts, beliefs, desires, impulses, aspirations, and happiness are supremely important. Science must not only accumulate facts. It must consider

sensations, the technique of apprehending knowledge, and the motives and feelings which lie behind the gathering of knowledge, subtly affecting this or that paper on pure research in this or that way.

Here is a subjective feeling. The religious man notes it and says "That is God working in and through me. I feel it. I am happy! I am saved!" The agnostic feels it and says, "That is undoubtedly my nerves. Or else the cheese I eat at nights—or the tobacco I smoke; or I work too hard; or I am getting neurotic—Oh I don't know what it is but I feel terrible." The atheist feels it and says, "I know jolly well that's not God making me feel that way. I have bad teeth and high blood pressure. Glory be to No-God."

There is the basic problem for science. Why do we all interpret the same very facts or feelings in such widely divergent ways? Here are the feelings and facts. There are the interpretations. Here are the sensations; there are the conclusions. Here is the knowledge; there are the deductions. Why do these twain differ so when different individuals are concerned? Science, soon or late, must face and solve such problems as these.

CONSIDER one more example, in morals. Morals have long been imbedded in folklore, mores, custom, religion, even whim. There are no reliable criteria of ethics in a scientific sense. Creeds have disintegrated but science has failed to formulate any sound ethical doctrines—this in spite of the fact that the laboratory attitude of the scientist toward facts and the relations the best of scientists have with each other are constantly exemplifying the highest ethics man has so far known. Why has science failed?

Because humanism is tabu and shush shush always meets it in gatherings of pure scientists. "That is indecent in this holy place. These are the sacred precincts of Impersonality. Respect the tabernacle of science." Then, in turn, scientists become incensed when religious writers deny science respect, say it should keep to a restricted sphere, and that its methods have no value in broad human relations. This is not true, but scientists have brought the accusation directly upon themselves. People generally and rightly fear a desiccated and dehumanized science, and often prefer ignorant, though at least human, clergymen and politicians to run their affairs. They cannot be blamed.

Yet science has the key to all problems in human relations. It alone can temper emotion with accurate, critical observation; fancy with reliably ascertained and carefully validated facts. To face the facts as

intelligently and as objectively as possible is the only way for humanity to get anywhere. Observation must follow observation until statistical results largely eliminate the individual prejudice and error necessarily inherent in the work of the best scientists, but science must invade the realm of humanism. It can only do so after having come to a full realization of the fundamental importance of plain human values.

Writing a few years ago to Prof. Raymond Pearl, William E. Ritter said: "For my part, I do not see how we special students of living nature can escape much longer the responsibility of doing our share toward analyzing our knowledge-getting, and especially our knowledge-using activities. This responsibility we must face, it seems to me, despite the, at first sight, rather staggering prospect of having to take a hand with philosophers, ethicists, religionists, artists and the rest in shaping human affairs toward human welfare at the highest levels it seems capable of reaching."

SCIENTISTS then did not realize the actual fact that their job was that of conquering the world. Today they dimly realize it and we actually have social scientists highly placed in the Administration following the experimental method in their attempted solutions of our economic problems. This process must continue, regardless of virulent criticism and gross superstitions of the banker-industrialist age. We can only work out our destiny as a nation by the fearless utilization of the experimental laboratory method. When a President can say not "I intend to do this and in this manner because my method can not fail" but, as President Roosevelt says, "We shall try to do this in one way if possible; if not we shall try another method, but do it we shall" a new epoch has dawned, though the fact passes strangely unobserved.

In the past just sufficient respect for science has been generated to be dangerous, because it was grounded in awe at the crudest practical applications of research and was based upon a misconception. It is probably true that a slogan announcing a man as a great engineer, and therefore a scientist, was capable of gathering to him many votes. But the fact that a man is an engineer does not mean at all that he is a scientist or a practitioner of scientific method, and that alone is important—that football—teamwork attitude of developing plays that become necessary in the immediate situation. That a man is an engineer means merely that he has mastered certain technical processes and that he knows how to perform certain complex operations better than ordinary men. It vouchsafes nothing whatever about the man's general intelligence, his

ability as a statesman in modern times, his fundamental philosophy, or what he may be expected actually to do under specific conditions.

Our problems today demand that power be placed in the hands of men who know the technique of using scientific methods, not men who hold certain economic or other dogmas and who are determined that amelioration of conditions can only occur if it does so within a particular frame of reference they do not intend to sacrifice at any cost. Even the fact that a man is a scientist would not qualify him for office as President because the occupant of that office must be a humanistic or biological engineer in the broadest possible sense, a person with a sweeping philosophic outlook, extreme tolerance, and the highest intelligence. As for specialized knowledge, that is always at hand to use in the minds of the experts.

The scientist of today is more likely to be a timid and exceedingly narrow specialist who ruthlessly dehumanizes himself in one segment of his mental life that he may ascertain certain facts therein, but who in his general life is as emotional, as unbalanced, and as incompetent as other men. He thus ceases to be a whole man, but has a compartmentalized mind in which one compartment works deliberately against the others. Yet, at his best, he becomes the finest type humanity has so far produced. He uses a technique which can completely renovate our so-called social system or civilization, when he fuses his scientific method with humanism, realizes the general utility of that method, and overcomes his diffidence and timidity about facing the pressing problems of real everyday life which alone matter to mankind in the mass.

U. S. Civil Service Examinations

Applications to take the following examinations should be on file, not later than March 11, 1935, with the U. S. Civil Service Commission, Washington, D.C.: Principal Pharmacologist, $5,600.00 a year; Senior Pharmacologist, $4,600.00; Pharmacologist, $3,800.00; Associate Pharmacologist, $3,200.00; Assistant Pharmacologist, $2,600.00. Food and Drug Administration, Department of Agriculture. College degree and experience required for all positions. Full information and necessary application forms may be obtained from the Commission at Washington, from the Federal Building, New York City, and from Civil Service district offices in other cities.

The Varnish and Lacquer Industry

A contribution from the laboratory of the Glidden Company.

VERY few people realize the hundreds of raw materials the paint, varnish, and lacquer chemist draws upon in order to produce his finished products. From something over two hundred varieties of red pigments to twice that number of gums, pitches, resins, and driers, a rather large total is reached when added to the black, blue, brown, green, white, and yellow pigments, together with the oils, solvents, and miscellaneous materials.

Of this list of raw materials, the vegetable oils and gums are mixtures of varying chemical composition. The oils will vary in composition and characteristics, according to the climate in which the seed was grown and the amount of sunshine and rain in any particular season. These variations must be checked as far as possible by chemical means, and certain allowances be made for them. The natural gums are even worse in this respect, relatively little being known about their chemical constitution. These raw materials are manufactured into finished products to fit the demands of industry with respect to durability, flexibility, adhesion, color, cost, drying time, and such other factors as are considered necessary for any particular application.

The technical workers in the industry may be conveniently divided into those who develop new oils, resins, and varnishes, those who produce finished paints and enamels, and those who produce finished lacquers made primarily from nitrocellulose solutions. Aiding all of these groups are the chemists who are studying the nature and properties of the raw materials, and studying the use of newly developed chemicals in products for the industry.

In using the natural occurring gums, which are in general highly polymerized organic compounds, the varnish maker has seriously impaired their chemical and physical resistance to atmospheric and corrosive influences. This was necessary because the gums were insoluble in the vegetable oils without heating to a high temperature, thus decomposing and depolymerizing the gum. There was one exception to this general statement, rosin, a naturally occurring gum quite abundant in this country. This gum was very poor in weather resistance and con-

ability as a statesman in modern times, his fundamental philosophy, or what he may be expected actually to do under specific conditions.

Our problems today demand that power be placed in the hands of men who know the technique of using scientific methods, not men who hold certain economic or other dogmas and who are determined that amelioration of conditions can only occur if it does so within a particular frame of reference they do not intend to sacrifice at any cost. Even the fact that a man is a scientist would not qualify him for office as President because the occupant of that office must be a humanistic or biological engineer in the broadest possible sense, a person with a sweeping philosophic outlook, extreme tolerance, and the highest intelligence. As for specialized knowledge, that is always at hand to use in the minds of the experts.

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tained a large amount of free acid. As the oils used in the paint industry were the triglycerides of organic acids, some one suggested neutralizing the rosin, largely abietic acid, with glycerine. This resulted in a much superior product, and when used in varnishes, proved very weather resistant. This gum, sold today as ester gum, is soluble in oils without first heating the gum, melts without appreciable chemical change taking place, and is used in large quantities.

A MORE recent development along similar lines is a modification of ester gum, made by substituting other organic acids for a part or all of the rosin or abietic acid. Of particular importance has been the use of phthalic acid or its anhydride. The reaction between glycerine and phthalic anhydride has been known to produce a resin for over thirty years. Only a very few years ago a new process for the manufacture of phthalic anhydride catalytically brought the price of this acid down to the point where it was of interest to the varnish chemist. Since that time an almost infinite number of resins, oils, and varnishes have been prepared by varying the proportions and kinds of organic acids condensed with glycerine and other polyhydric alcohols. The type of product produced may be a hard, brittle resin soluble in esters used in lacquers, a gummy resinous mass soluble in aromatic hydrocarbons, or a molasses like oil soluble in aliphatic hydrocarbon solvents. In general, monobasic acids give greater solubility, while polybasic acids impart more resinous characteristics. When some of these resins are heated again, they become insoluble and infusible, as polymerization continues.

This rather reverses the process of the old type varnish. Then it was necessary to take a highly polymerized gum and break it down by heat in order to use it. Now we start out with the constituents, condense them together, and then polymerize them just short of the point at which they become insoluble in the solvents we desire to use. After this, the desired pigments are introduced, the material applied to a surface, and then rendered insoluble either by baking or aging. The resulting finishes show unusual adhesion to most surfaces, great flexibility, and long wear, with final failure by gradual disintegration rather than by cracking and checking. While this type of finish will show excellent durability out of doors, it is very susceptible to water, softening and turning white after relatively short immersion in water. When removed from the water, the film hardens down again and becomes a protective film.

For a long time phenol and formaldehyde have been condensed together and polymerized to form plastic resins for many uses and with

outstanding chemical and physical properties. Many attempts were made to prepare a resin of this type, which could be dissolved in oils after the manner of treated fossil or natural gums. Very little success was had for a long time. It has been known that rosin is a good fluxing agent, solvent, or dispersing medium, and it was frequently added to a batch of hot varnish in a kettle to "catch" the varnish, or prevent the formation of a gel. This would prevent the varnish from gelatinizing before it cooled down to a point where thedesired solvents could be added. Ester gum also possessed this property to a considerable degree, but was not as effective as rosin.

THE first phenol-formaldehyde resins successfully used in the varnish industry were condensed and polymerized in the presence of relatively large quantities of rosin or ester gum. These first materials showed such promise in durability and increased drying speed that work was continued along these lines and an excellent line of resins developed. As experience in the manufacture of the products was gained the proportion of the rosin or ester gum was gradually cut down. In other cases oil acids were used for the solvent in place of rosin, and when the glycerine was added, an oil resulted instead of ester gum. As work progressed, additional phenols and modifications were developed, until today we find phenolic resins available to the varnish maker, which contain no rosin, ester gum, oil, or other materials. These resins may be used in any proportions to give the varnish the particular properties desired by the maker.

This particular class of resins are noted for their durability, speed of drying, water, acid, and alkali resistance. They have their weaknesses, however, the paramount difficulty being that products in which they are used frequently tend to turn very yellow on aging. This feature is of course not objectionable where black and dark colored finishes are concerned. Here again we reverse the earlier methods, building up a resin from its components rather than tearing down the gum in order to make it useful to us.

Work on the above types of synthetic resins is being continued in an endeavor to overcome their disadvantages. Other resins comprising polymerization products of cumarone, chlorinated diphenyl, indene, styrol, phenophthalein condensates, various vinyl derivatives, urea-formaldehyde products and other organic resin-forming compounds are being investigated. The synthetic resin chemist is not so much interested in reactions yielding pure crystalline compounds, but complex, resinous, tarry products whose properties may be controlled.

The use of low viscosity nitrocellulose solutions mixed with gums and plasticisers is an old story with most of us. The major advantage is rapid rate of drying. The disadvantages are the lack of adhesion, durability, low solids content, expensive solvents, and need for increased gloss. Certain of the newer synthetic resins possess to a considerable degree a number of the advantages which nitrocellulose does not have. Many of them are also lower in price than nitrocellulose. Increasing quantities of these resins have been added to the nitrocellulose until in some cases the resinous portion of the vehicle runs as high as 80%, as against 20% nitrocellulose.

These changes in the manufacture of lacquers have reduced costs, improved the durability of the lacquers, and led to an increase in the solid ingredients present.

Where such a large proportion of resin is used, the function of the nitrocellulose seems to be more in the nature of a material to effect a quick dry or setting of the film. Certain of these resinous materials are also being used in nitrocellulose lacquers to replace the softening agents necessary to render the films flexible. These products are used in place of dibutyl phthalate, and tricresyl phosphate, the ester type, which are more volatile and therefore less permanent than the resin type.

Nitrocellulose alone deteriorates rather rapidly when exposed out of doors, or under the influence of ultra-violet rays. A number of the resins used in these newer types of lacquers exhibit unusual resistance to the destructive effects of ultra-violet light, as well as moisture and humidity.

THE chemist has also contributed his bit to the improvement of driers in the industry. The earliest methods were the suspending of a basket of Umber in the oil while cooking, or by adding metallic salts or oxides to the oil during cooking. The preparation of metallic salts of certain organic acids has been a great improvement. These salts are in general completely soluble in the solvents used in the varnish, the exact metal content is easily determined, and there is no loss by volatilization or precipitation. All this makes for very accurate control of the metal content, avoids waste, and increases uniformity between batches. In general the lead, cobalt, and manganese salts are employed, but others possess certain desired effects, such as copper, zinc, and aluminum.

There are three outstanding achievements of relatively recent date in the field of pigments. The most generally desirable characteristics

of pigments for use in the paint industry are probably hiding or covering power, permanence of color, and ease of incorporation.

The hiding power is a direct function of the difference between the index of refractions of the vehicle and pigment, the greater the difference the greater the hiding power and the less pigment needed to cover a given area. Titanium dioxide is a white pigment developed and sold in tremendous volume in various forms. This pigment has very high covering power as well as other desirable properties.

The development of cadmium sulphides and selenides have given us a range of yellows and reds of very great permanence. These pigments are also characterized by their insolubility in solvents. This fact is very important, as many of the organic reds used in the paint industry are soluble in certain solvents or oils and so "bleed" into succeeding coats of clear finishes.

The fastness of certain dyes used in pigment work has also been vastly improved. The dyes used in paints have generally been "struck" on an aluminum hydrate or other base. These colors have frequently shown rather serious fading on outdoor exposure over long periods of time. At the present time a line of colors which darken slightly on aging are being sold. This improvement has been brought about by the use of new bases, such as phosphotungstic acid. The dyes precipitated on this type of base are finding wide use in the paint and varnish trade.

CHEMISTRY AT IOWA UNIVERSITY

(*Continued from page 37*)

examination are required. Under certain conditions, the master's examination may be made a qualifying examination for the doctorate. The doctor's degree is granted after a minimum of three years of graduate work of which at least one year must be in residence. A qualifying examination for the doctor's degree is preceded by examinations to determine whether the candidate has a reading knowledge of French and German, and must be taken not less than one year before the final examination. After the acceptance of the thesis, the final examination is given. In most cases the candidate offers minors outside of the department.

Since the department entered its present building, it has had an enlarged personnel and increased equipment. The registration of graduate majors in chemistry has increased from nine in 1920 to 94 in 1931 and 82 in 1932. Scholarships, fellowships, and research assistantships in chemistry are offered by the graduate college. Graduate assistants are appointed by the college of liberal arts.

BOOK REVIEW

THE LAW OF PATENTS FOR CHEMISTS. BY JOSEPH ROSSMAN. 360 pages. Published by *The Williams & Wilkins Co.*, Baltimore, Md. Price $4.50.

The second edition of this valuable and instructive book relating to patents as they affect chemists is greatly enlarged over the first edition, which appeared in 1931.

The author modestly states in his preface that it is intended as a treatment of the technical subject of patent law in language which would be comprehended by chemists without legal training whereas, as a matter of fact, it is one of the most valuable publications for patent attorneys and especially for those interested in the protection of chemical inventions.

The author has deviated widely from the form of publications upon this subject, which are usually devoted to a compilation of the patent laws and the rules of the Patent Office with scattered references to decisions relative thereto. In this publication, however, the subject matter is approached from the opposite viewpoint and a full discussion is given of the obligations resting upon chemical inventors, in order that they may protect their rights prior to entrance into the Patent Office, and the proper method of procedure in the preparation, filing, and prosecution of their patent applications.

As a result, the book is a most readable one upon this subject and the reader is unconsciously carried to a full appreciation of the necessary steps he must take from the inception of an idea to its final issuance as a patent. The subject matter is fully covered by many court decisions illustrating the various points under discussion and the result is a clear appreciation of the information advanced by the author. This edition has been considerably enlarged over the previous edition and contains new matters of considerable interest, including those of chemical patent problems relating to food, medicine, metallurgy, and bacteriology, as well as court decisions which have been handed down since the prior edition.

One of the chapters which is of the greatest importance to inventors is that relating to what is an invention, and the author has clarified this subject more clearly than the reviewer has found in any prior publication upon this subject. This chapter alone is well worth the closest attention of chemists who are interested in chemical research

for the development of new chemical processes and products. The chapters which are of particular interest to the chemist are those relating to the data upon which an application should be filed, the legal definition of an invention, and the preliminary steps which the chemist should take in order to protect his rights prior to the filing of his application.

The chapters relating to the prosecution of an application in the Patent Office are as valuable to the expert patent attorney as they are to the chemist and the many cited decisions are so arranged with regard to subject matter as to make the publication one of easy reference to attorneys who are interested in any particular complication which has arisen in the Patent Office.

The author has made good use of his many years' experience as an examiner in the Patent Office and of his extended practice before the courts and, as a result, this book is undoubtedly one of the most informative and valuable publications upon the subject matter under treatment, and a copy of it should be in the hands of every chemist and every patent attorney. H. S. N.

ADDRESSES WANTED

The office of the Secretary of the Institute desires to obtain the present addresses of the following members. Anyone able to assist the Secretary in this connection is requested to communicate with him at 233 Broadway, New York City.

Irvin Cole
formerly: 2331 Cambrelling Ave.
New York, N. Y.

Galen F. Hoffman
formerly: Juniata College
Huntingdon, Pa.

Henry N. Keife
formerly: Calco Chemical Co.
Bound Brook, N. J.

John H. Kuesel
formerly: Rock County Hospital
Orangeburg, N. Y.

Harold E. Moore
formerly: 2292 Indiana Avenue
Columbus, Ohio

Alvin W. Underkoffler
formerly: Juniata College
Huntingdon, Pa.

Kenneth G. Watkins
William C. Watkins
formerly: 735 N. Tuxedo Avenue
Stockton, Calif.

INSTITUTE NOTES

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Calco Chemical Co.,
Bound Brook, N. J.

HOWARD S. NEIMAN, *Secretary*
233 Broadway
New York, N. Y.

ARTHUR J. HILL, *Vice-President*

ALAN PORTER LEE, *Treasurer*

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ALBERT P. SACHS	FLORENCE E. WALL	FREDERICK W. ZONS

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CHAPTER REPRESENTATIVES

Philadelphia	*New York*	*Washington*	*Niagara*
C. W. RIVISE	LLOYD VAN DOREN	J. W. MCBURNEY	ARTHUR W. BURWELL

National Council

January Meeting

The one hundred and eighteenth meeting of the Council of The American Institute of Chemists was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on Thursday, January 17, 1935.

President M. L. Crossley presided.

The following Councilors and Officers were present:

Messrs. R. A. Baker, F. G. Breyer, M. L. Crossley, D. D. Jackson, A. P. Lee, H. S. Neiman, F. W. Zons and Miss F. E. Wall.

The minutes of the previous meeting were approved.

The report of the Treasurer showing a cash balance of $1,274.41 and an excess of assets over liabilities of $652.59 was accepted.

The Secretary reported on the delinquents owing more than two years' dues and he was directed to write each one of the delinquents requesting the reasons for the delinquency, advising him that he will be dropped from membership automatically if his dues are not paid on or before February 20th.

Mr. Lee reported upon THE CHEMIST, and it was suggested that he have Miss Kimball cooperate with him in the issuance of the publication.

Miss Wall reported for the Committee on Student Medals and upon motion made and seconded, the yellow bronze medal was adopted.

The question of the method of awarding student medals was discussed and the matter was referred to the Committee on Professional Education, with the request that it report to the next meeting of the Council and suggest methods for awarding these medals; and the Secretary was requested to write Dr. Taggart to this effect.

A letter from W. R. Sassaman, Labor Advisory Board of the NRA, concerning suggested amendments relative to chemists now included in adopted codes, was discussed at length but no action was taken upon it as no report had been received from the Committee appointed for this purpose.

There being no further business, adjournment was taken.

Pennsylvania Chapter

The January meeting was held in the Board Room of the Engineers' Club, Philadelphia, on Tuesday, Jan. 15, at 8:00 P. M. Mr. Stoertz presided.

The minutes of the December meeting as read by the Secretary were approved. The Chairman read excerpts from the minutes of the 117th meeting of the National Council held Dec. 20, in New York City, noting that upon action made and seconded the annual dues of Fellows were reduced from $10.00 to $5.00.

The Chairman presented a letter of Dec. 12, from W. R. Sassaman, Labor Advisory Board, NRA, relative to certain suggested amendments relative to chemists now included in adopted codes. The matter has been referred to a special Committee appointed by President Crossley.

The Program Committee has arranged that the subject of licensing chemists will be discussed at the next monthly meeting. Mr. Harrison has agreed to lead the discussion.

The topic of the evening was "Experiences in Research," presented in an instructive and entertaining talk by Dr. Graham of the University of Pennsylvania. The subject evoked a lively and interesting discussion by several of the members present.

Washington Chapter

The Washington, D. C., Chapter of the American Institute of Chemists held its second meeting on Friday, January 11th, in the Board Room of the Cosmos Club.

T. Swann Harding of the U. S. Department of Agriculture, well-known writer and editor, gave a most interesting address on the subject, "Can Science Be Humanized?" The earnest discussion on the part of several of those present, immediately afterward, is indicative of the thought-provoking content of the address.

The large attendance was a source of pleasure to the officers of the Chapter and it was suggested that larger quarters be obtained for the next meeting.

The announcement that Fellowship dues had been reduced to five dollars per annum met with unanimous approval. An early increase in membership on the basis of this reduction is anticipated.

The Chapter voted to accept the proposed New York State licensing bill for chemists, in principle, after a favorable report was made by the Committee assigned to investigate the proposed bill.

The meeting was one of the most successful ever held by this Chapter.

Niagara Chapter

The tenth regular meeting of the Niagara Chapter, American Institute of Chemists, was called to order by the vice-chairman, Charles F. Smith, at 6:30 P. M., Friday, February 1, 1935, at Buffalo Consistory. Present: Brown, Burwell, Cartledge, Camelford, Hall, Hyden, Lawton, Milne, Perkins, Post, Rasch, Sievenpiper, W. R. Sheridan, C. F. Smith, W. A. Smith, and Taylor. Dr. Fred R. Koethien of the Acheson Graphite Company and Dr. Alvin Shepard of the General Plastics Corp., Tonawanda, were present as guests. After the dinner the meeting was called to order for business and discussion.

Dr. Carl Rasch and Mr. Theodore R. Milne were introduced as new members by William L. Hyden, Chairman of the Membership Committee. Reduction of annual dues by the national organization was announced by the Chairman. A tellers committee was appointed by the chairman to consist of L. M. Lawton and J. A. Camelford. The committee on professional ethics, M. C. Taylor, reported that the status of the Federation of Architects, Engineers, Chemists and Technicians had been investigated. The data on hand is at present insufficient to warrant drawing any conclusion as to the nature of the organization or its future. Moved by A. W. Burwell, seconded by W. L. Hyden that the committee be instructed to continue its investigation. Motion carried unanimously. The committee on professional education, W. R. Sheridan, reported that the Grosvenor Library is continuing its survey of chemical literature on hand in this area. The matter of requirements for secondary school teachers is still being investigated. The welfare committee, L. M. Lawton, reported continuance of the work with regard to the placement of chemists in this area. The Chairman spoke of the satisfaction resulting from the placing of two such men. The publicity committee, A. L. Hall, reported progress toward the goal of the series of newspaper articles. The Chairman passed on to the committee a suggestion from Mr. Norton that if possible "The Double Bond" be made more use of and that "Chemical Markets" be given some material. The membership committee, W. L. Hyden, had no further report.

The chapter representative, A. W. Burwell, reported the high regard outsiders seem to have for the advances made by the Niagara Chapter. The matter of licensing is now at a standstill, as far as the Niagara Chapter is concerned. Dr. Burwell reported that there seemed to be a decided attitude in the Institute favoring the policies of the British Institute of Chemistry. The tellers committee reported the results of the election as: Chairman, Charles F. Smith; Vice-chairman, Groves H. Cartledge; Secretary-Treasurer, Howard W. Post; Chapter Representative, Arthur W. Burwell.

The question of the proposed seminar or seminars to be given by the University of Buffalo was brought up by the Chairman. It was suggested that the Committee on Professional Education consult and cooperate with the Department of Chemistry of the University of Buffalo. The secretary read an extract from the letter of W. J. Cotton extending his greeting to the Chapter. The program followed, discussion centering around the topic, "Continuing the Education of the Chemist after College."

New York Chapter

A meeting of the New York Chapter will be held at The Chemists' Club, 52 East 41st Street, New York, N. Y., February 15th, at 8:00 o'clock. Dinner preceding the meeting will be served at 6:30. Dr. Walter H. Eddy, Professor of Physiological Chemistry at Columbia University, will talk on, "Practical Value of Food Research." Ephraim Freedman, F.A.I.C., Director of Macy's Bureau of Standards, will speak on "Chemistry and the Trend of Consumer Acceptance."

Institute Activities as Translated from the Minutes

By F. E. W.

OF IMPORTANCE to all members everywhere is the announcement that the dues for Fellows have been reduced to five dollars again, and your Council hopes that this gesture will bring in large numbers of recruits from those who may have been teetering on the brink. Remember that this halving of the dues means doubling the number of Fellows on the roster if the budget is to be met, so please give serious consideration to the suggestions of the Membership Committee, which went out to you recently, and bring in some new members.

The Student Membership Medals are ready, and very attractive they are: dull gold bronze on a broad green ribbon. The Committee on Professional Education is to report at the next Council meeting on the plan for selecting the recipients of this medal, and medals will be available for distribution to this year's classes. This award should stimulate interest in the activities of the Institute, and your Council hopes that each local chapter will take advantage of it.

There was considerable excitement recently because of the circulated rumor that "The Institute's code is up for consideration at Washington"—all due to a misunderstanding of a perfunctory inquiry from the Labor Advisory Board.

It seems that sometime last fall at a hearing on one of the codes in the Chemical Division of the NRA, the question was raised about the status of chemists under these codes. You may recall that the NRA, as originally planned, was to stimulate industry for the benefit of labor chiefly: hence those minimum wages of $15 a week ("$12 in the South"). It was in vain that chemists, caught in what might be included in laboring jobs, protested that they were professional men and therefore entitled to higher compensation. It was of no use. According to the definition, a professional person was anyone who earned $35 or more a week. It was all very confusing.

Because of the sad plight of many chemists, the Institute presented a code, which embodied a philosophy of evaluation of professional service. If codes for professional groups were to be considered, we wanted to have the privilege of defining professional service as something broader than just labor in terms of hours and dollars. But no professional codes were accepted for consideration; so that was that.

Now it seems that the Labor Advisory Board has become conscious of the large numbers of chemists employed in certain industries, and wanted the opinion of the

(*Please turn to page 60*)

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The Secretary reported on the delinquents owing more than two years' dues and he was directed to write each one of the delinquents requesting the reasons for the delinquency, advising him that he will be dropped from membership automatically if his dues are not paid on or before February 20th.

Mr. Lee reported upon THE CHEMIST, and it was suggested that he have Miss Kimball cooperate with him in the issuance of the publication.

Miss Wall reported for the Committee on Student Medals and upon motion made and seconded, the yellow bronze medal was adopted.

The question of the method of awarding student medals was discussed and the matter was referred to the Committee on Professional Education, with the request that it report to the next meeting of the Council and suggest methods for awarding these medals; and the Secretary was requested to write Dr. Taggart to this effect.

A letter from W. R. Sassaman, Labor Advisory Board of the NRA, concerning suggested amendments relative to chemists now included in adopted codes, was discussed at length but no action was taken upon it as no report had been received from the Committee appointed for this purpose.

There being no further business, adjournment was taken.

Pennsylvania Chapter

The January meeting was held in the Board Room of the Engineers' Club, Philadelphia, on Tuesday, Jan. 15, at 8:00 P. M. Mr. Stoertz presided.

The minutes of the December meeting as read by the Secretary were approved. The Chairman read excerpts from the minutes of the 117th meeting of the National Council held Dec. 20, in New York City, noting that upon action made and seconded the annual dues of Fellows were reduced from $10.00 to $5.00.

The Chairman presented a letter of Dec. 12, from W. R. Sassaman, Labor Advisory Board, NRA, relative to certain suggested amendments relative to chemists now included in adopted codes. The matter has been referred to a special Committee appointed by President Crossley.

The Program Committee has arranged that the subject of licensing chemists will be discussed at the next monthly meeting. Mr. Harrison has agreed to lead the discussion.

The topic of the evening was "Experiences in Research," presented in an instructive and entertaining talk by Dr. Graham of the University of Pennsylvania. The subject evoked a lively and interesting discussion by several of the members present.

Washington Chapter

The Washington, D. C., Chapter of the American Institute of Chemists held its second meeting on Friday, January 11th, in the Board Room of the Cosmos Club.

T. Swann Harding of the U. S. Department of Agriculture, well-known writer and editor, gave a most interesting address on the subject, "Can Science Be Humanized?" The earnest discussion on the part of several of those present, immediately afterward, is indicative of the thought-provoking content of the address.

The large attendance was a source of pleasure to the officers of the Chapter and it was suggested that larger quarters be obtained for the next meeting.

The announcement that Fellowship dues had been reduced to five dollars per annum met with unanimous approval. An early increase in membership on the basis of this reduction is anticipated.

The Chapter voted to accept the proposed New York State licensing bill for chemists, in principle, after a favorable report was made by the Committee assigned to investigate the proposed bill.

The meeting was one of the most successful ever held by this Chapter.

Niagara Chapter

The tenth regular meeting of the Niagara Chapter, American Institute of Chemists, was called to order by the vice-chairman, Charles F. Smith, at 6:30 P. M., Friday, February 1, 1935, at Buffalo Consistory. Present: Brown, Burwell, Cartledge, Camelford, Hall, Hyden, Lawton, Milne, Perkins, Post, Rasch, Sievenpiper, W. R. Sheridan, C. F. Smith, W. A. Smith, and Taylor. Dr. Fred R. Koethien of the Acheson Graphite Company and Dr. Alvin Shepard of the General Plastics Corp., Tonawanda, were present as guests. After the dinner the meeting was called to order for business and discussion.

Dr. Carl Rasch and Mr. Theodore R. Milne were introduced as new members by William L. Hyden, Chairman of the Membership Committee. Reduction of annual dues by the national organization was announced by the Chairman. A tellers committee was appointed by the chairman to consist of L. M. Lawton and J. A. Camelford. The committee on professional ethics, M. C. Taylor, reported that the status of the Federation of Architects, Engineers, Chemists and Technicians had been investigated. The data on hand is at present insufficient to warrant drawing any conclusion as to the nature of the organization or its future. Moved by A. W. Burwell, seconded by W. L. Hyden that the committee be instructed to continue its investigation. Motion carried unanimously. The committee on professional education, W. R. Sheridan, reported that the Grosvenor Library is continuing its survey of chemical literature on hand in this area. The matter of requirements for secondary school teachers is still being investigated. The welfare committee, L. M. Lawton, reported continuance of the work with regard to the placement of chemists in this area. The Chairman spoke of the satisfaction resulting from the placing of two such men. The publicity committee, A. L. Hall, reported progress toward the goal of the series of newspaper articles. The Chairman passed on to the committee a suggestion from Mr. Norton that if possible "The Double Bond" be made more use of and that "Chemical Markets" be given some material. The membership committee, W. L. Hyden, had no further report.

The chapter representative, A. W. Burwell, reported the high regard outsiders seem to have for the advances made by the Niagara Chapter. The matter of licensing is now at a standstill, as far as the Niagara Chapter is concerned. Dr. Burwell reported that there seemed to be a decided attitude in the Institute favoring the policies of the British Institute of Chemistry. The tellers committee reported the results of the election as: Chairman, Charles F. Smith; Vice-chairman, Groves H. Cartledge; Secretary-Treasurer, Howard W. Post; Chapter Representative, Arthur W. Burwell.

The question of the proposed seminar or seminars to be given by the University of Buffalo was brought up by the Chairman. It was suggested that the Committee on Professional Education consult and cooperate with the Department of Chemistry of the University of Buffalo. The secretary read an extract from the letter of W. J. Cotton extending his greeting to the Chapter. The program followed, discussion centering around the topic, "Continuing the Education of the Chemist after College."

New York Chapter

A meeting of the New York Chapter will be held at The Chemists' Club, 52 East 41st Street, New York, N. Y., February 15th, at 8:00 o'clock. Dinner preceding the meeting will be served at 6:30. Dr. Walter H. Eddy, Professor of Physiological Chemistry at Columbia University, will talk on, "Practical Value of Food Research." Ephraim Freedman, F.A.I.C., Director of Macy's Bureau of Standards, will speak on "Chemistry and the Trend of Consumer Acceptance."

Institute Activities as Translated from the Minutes

By F. E. W.

OF IMPORTANCE to all members everywhere is the announcement that the dues for Fellows have been reduced to five dollars again, and your Council hopes that this gesture will bring in large numbers of recruits from those who may have been teetering on the brink. Remember that this halving of the dues means doubling the number of Fellows on the roster if the budget is to be met, so please give serious consideration to the suggestions of the Membership Committee, which went out to you recently, and bring in some new members.

The Student Membership Medals are ready, and very attractive they are: dull gold bronze on a broad green ribbon. The Committee on Professional Education is to report at the next Council meeting on the plan for selecting the recipients of this medal, and medals will be available for distribution to this year's classes. This award should stimulate interest in the activities of the Institute, and your Council hopes that each local chapter will take advantage of it.

There was considerable excitement recently because of the circulated rumor that "The Institute's code is up for consideration at Washington"—all due to a misunderstanding of a perfunctory inquiry from the Labor Advisory Board.

It seems that sometime last fall at a hearing on one of the codes in the Chemical Division of the NRA, the question was raised about the status of chemists under these codes. You may recall that the NRA, as originally planned, was to stimulate industry for the benefit of labor chiefly: hence those minimum wages of $15 a week ("$12 in the South"). It was in vain that chemists, caught in what might be included in laboring jobs, protested that they were professional men and therefore entitled to higher compensation. It was of no use. According to the definition, a professional person was anyone who earned $35 or more a week. It was all very confusing.

Because of the sad plight of many chemists, the Institute presented a code, which embodied a philosophy of evaluation of professional service. If codes for professional groups were to be considered, we wanted to have the privilege of defining professional service as something broader than just labor in terms of hours and dollars. But no professional codes were accepted for consideration; so that was that.

Now it seems that the Labor Advisory Board has become conscious of the large numbers of chemists employed in certain industries, and wanted the opinion of the

(*Please turn to page 60*)

NEWS

Charles Barban, F.A.I.C., gave a talk entitled, "The Cosmetic Peril," before a meeting of national Beauty Editors, at the Hotel Pierre, New York City, December 14th.

A meeting of the American Association of Cereal Chemists was held in New York on February 5th. Dr. D. A. Coleman, Editor of *Cereal Chemistry*, spoke on "The Activities of the Grain Division of the Bureau of Agricultural Economics and Their Relation to the Fields of Cereal Chemistry and Agriculture."

Benjamin Harrow, F.A.I.C., read a paper on "The Sex Hormones" at a meeting of the Mandel Chemical Society on December 14th.

Professor L. T. Work read a paper on "The Application of Fine Particles in the Chemical Engineering Industries," at a meeting of The American Institute on January 23rd.

E. I. du Pont de Nemours & Co. announce the production of a new explosive, "nitramon," which cannot be exploded accidentally by fire, force, or bullets. This "foolproof" explosive when detonated with a dynamite cartridge releases 40% more force than TNT. Made for mining use, it will eliminate accidents from unexpected discharge of blasting materials.

Jerome Alexander, F.A.I.C., left New York, February second, for a tour of the Mediterranean. After visiting Italy, Egypt, and Palestine, he plans to return by the end of March.

Theodore Markovits, F.A.I.C., and M. G. Weber, F.A.I.C., have established a partnership as food technologists and industrial chemists. Dr. Markovits has been technical director of Hoffman Beverage Company, Newark, N. J., for eight years, and previously chief chemist of Penick and Ford, New Orleans, La. Dr. Weber has acted as technical adviser to Philip Wirth, Inc., New York, N. Y., for a number of years, and since 1929 has been consultant on fruit-juice products in Florida and on quick frozen foods to Tom Huston, Inc., Columbus, Ga. The Institute wishes them success in their new partnership.

M. R. Bhagwat, Secretary of the Committee on Unemployment and Relief for Chemists and Chemical Engineers asks that every member of the Institute help the Committee's work by informing it of positions available, or by requesting every chemist unemployed in the greater Metropolitan area to register with it. He writes, "A large number of chemists are of the opinion that this Committee is simply a relief organization to take care of only those in destitute circumstances ...this Committee was primarily organized to secure positions for the unemployed... Relief is the last resort. It is very important that the Committee know the extent of unemployment in the profession so that it can effectively carry on its intended purposes."

A portrait of Charles H. LaWall, F.A.I.C., was presented to the Philadelphia College of Pharmacy and Science by the artist, Leon A. Spielman, at a meeting of the students, faculty, and trustees of the College on December fifth.

Charles A. Kraus, F.A.I.C., is the recipient of the 1935 Willard Gibbs Medal of the Chicago section of the American Chemical Society. Dr. Kraus is Research Professor of Chemistry at Brown University, and the award was given him for his research on the theory of solutions. Although his work has been wholly in the field of pure science, industrial processes in electrolysis, conductivity of metallic compounds, and the use of tetraethyl lead in gasoline, have been anticipated from his investigations.

SOME RECENT PUBLICATIONS BY MEMBERS

Journal of Chemical Education, January, 1935.

SAMUEL PALKIN, "The Acids of Pine Oleoresin and Rosin."

Industrial and Engineering Chemistry, February, 1935.

E. R. WEIDLEIN, "Perkin Medal—Accomplishments of the Medalist."

BERNARD L. OSER, "Critique of 1934 Interim Revision of Text and Assays for U. S. P. Cod Liver Oil."

American Medicine, September, 1934.

FLORENCE E. WALL, "The Historical Respectability of Cosmetics."

Journal of the Technical Association of the Fur Industry, September, 1934.

FLORENCE E. WALL, "Fifty Years of Paraphenylenediamine."

Journal of American Chemical Society, February, 1935.

ARTHUR E. HILL (with THOMAS B. FITZGERALD), "The Compounds of Sulfur Dioxide with Various Amines."

Industrial and Engineering Chemistry, News Edition, Jan. 10, 1935.

GUSTAVUS J. ESSELEN, "Research Guidance."

Professor Harold C. Urey, discoverer of heavy water and winner of the Nobel Prize in Chemistry for 1934, was honored at a farewell dinner on February first by the Chemists' Club. Professor Victor K. LaMer of Columbia University delivered the principal address, reviewing Professor Urey's work with the heavy isotope of hydrogen. Dr. George Murphy of Columbia, and Dr. F. G. Brickwedde of the U. S. Bureau of Standards, who assisted Professor Urey in his experimental work, were guests of honor. Professor Marston T. Bogert, F.A.I.C., of Columbia was the toastmaster.

Dr. Urey sailed with Mrs. Urey for Sweden on February 2nd, and will deliver the Nobel Address before the Swedish Royal Academy of Science on February 14th.

The following committee chairmen were appointed to organize the celebration of the 300th aniversary of the founding of chemical industry in this country: *Honorable Chairman*, Francis P. Garvan; *Chairman*, Arthur W. Hixson, F.A.I.C.; *Vice-chairman*, L. W. Bass, F.A.I.C.; *Treasurer*, D. P. Morgan, F.A.I.C.

The celebration will be held in connection with the eighty-ninth meeting of the American Chemical Society, in New York City, April 22nd to 26th, and is expected to be the largest assembly in the history of science.

The American Institute of Mining and Metallurgical Engineers, at their annual dinner on February 20th, at the Hotel Commodore, New York City, will present medals for distinguished work in the field of mining and metallurgy to George C. Stone, James MacNaughton, and Francis M. Rich.

The Association of Consulting Chemists and Chemical Engineers recently elected the following officers for 1935: T. A. Wright, F.A.I.C., *President;* Frank G. Breyer, F.A.I.C., *Vice-president;* Paul Mahler, *Secretary;* Alvin C. Purdy, *Treasurer;* R. T. Baldwin, *Executive Secretary.*

The New York Society of Model Engineers are exhibiting 1,500 models of miniature machines and locomotives in the Knickerbocker Building, 152 West 42nd Street, New York City. These models are built to scale and accurate in remarkable detail.

Applications for Membership

FELLOWS

CARL H. RASCH, *Chief Chemist,* Riverside Chemical Co., North Tonawanda, N. Y.

MEYER SAMSON, *Consultant,* Samson Laboratories, 1619 Spruce Street, Philadelphia, Pa.

APPLICATION TO BE RAISED FROM ASSOCIATE TO FELLOW

JAMES ALLAN CAMELFORD, *Chemist,* Alox Chemical Corporation, P. O. Box 949, Niagara Falls, N. Y.

Institute Activities as Translated from the Minutes

(*Continued from page 57*)

Institute on certain definitions and a salary schedule. Divergent views were frankly expressed, but since the definitions were based on the description of jobs, rather than the qualifications of the incumbents, it was the consensus of the Council that the Institute could not officially agree to these proposed amendments to the chemical codes.

Once more, an appeal to help THE CHEMIST and its Editor. We think it would be most helpful if each chapter would appoint an official reporter, who will collect local news chips and send them in each month. This reporter should be some one other than the secretary of the chapter, who, unless he is a glutton for work, usually has all he can to do to cover the local meetings.

THE CHEMIST will gladly publish all papers and addresses delivered at local meetings particularly those related to the *professional,* rather than the scientific aspects of chemistry.

David A. Kemper, F.A.I.C., died January 27, 1935. He was elected to membership in 1923. Mr. Kemper was educated at Cornell University and Polytechnic Institute of Brooklyn; and at the time of his death he was associated with the activated carbon developments of the Cleveland-Cliffs Iron Company.

IMPORTANT FACTS FOR THE CHEMIST ON *Pyrex* LAMP-BLOWN APPARATUS

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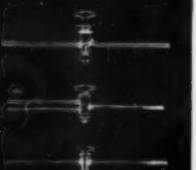

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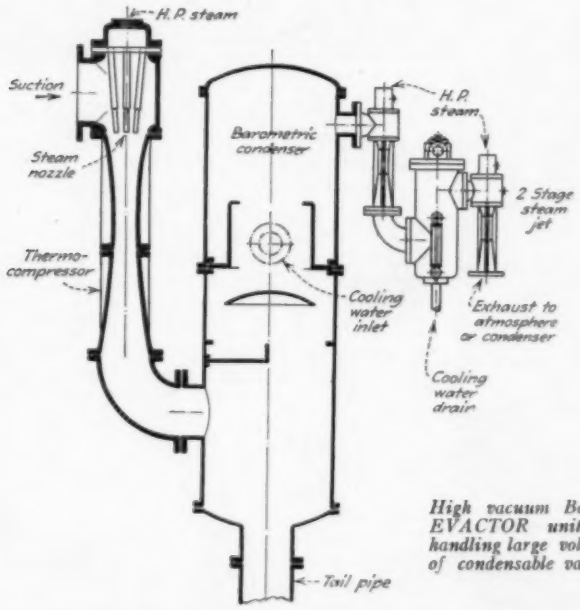

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